

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application. Please amend the claims as follows:

Listing of Claims

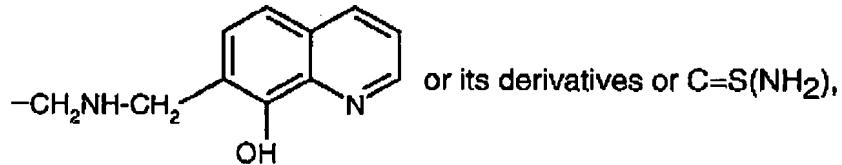
1. (Currently Amended) A method for producing an ion exchangers which comprises not only carboxyl groups but also and $-(CH_2)_mNR_1R_2$ groups, characterized in that comprising the steps of:

a) reacting monomer droplets of a mixture of a monovinyl aromatic compound, a polyvinyl aromatic compound, a (meth)acrylic compound, an initiator or an initiator combination, and also if appropriate a porogen are reacted to form, thereby, forming a crosslinked bead polymer, and

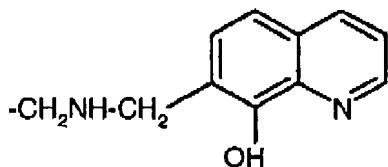
b) functionalizing the resultant crosslinked bead polymer is functionalized using chelating groups and reacting, in this functionalizing step, the copolymerized (meth)acrylic compounds are reacted to form (meth)acrylic acid groups, and where

m is an integer from 1 to 4,

R_1 is hydrogen or a radical CH_2-COOR_3 or $CH_2P(O)(OR_3)_2$ or $-CH_2-S-CH_2COOR_3$ or $-CH_2-S-C_1-C_4$ -alkyl or $-CH_2-S-CH_2CH(NH_2)COOR_3$ or



R_2 is a radical CH_2COOR_3 or $CH_2P(O)(OR_3)_2$ or $-CH_2-S-CH_2COOR_3$ or $-CH_2-S-C_1-C_4$ -alkyl or $-CH_2-S-CH_2CH(NH_2)COOR_3$ or



or its derivatives or $\text{C}=\text{S}(\text{NH}_2)$ and

R_3 is H or Na or K.

2. (Currently Amended) An ion exchanger which comprises not only carboxyl groups and but also $-(\text{CH}_2)_m\text{NR}_1\text{R}_2$ groups obtainable by

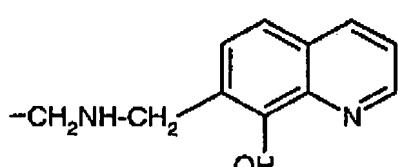
- a) reacting monomer droplets of a mixture of a monovinyl aromatic compound, a polyvinyl aromatic compound, a (meth)acrylic compound, an initiator or an initiator combination and also if appropriate a porogen to give a crosslinked bead polymer;
- b) functionalizing the resultant bead polymer using chelating groups and, in this functionalizing step, reacting the copolymerized (meth)acrylic compounds to form (meth)acrylic acid groups, where

m is an integer from 1 to 4,

R_1 is hydrogen or a radical $\text{CH}_2\text{-COOR}_3$ or $\text{CH}_2\text{P}(\text{O})(\text{OR}_3)_2$ or

$-\text{CH}_2\text{-S-CH}_2\text{COOR}_3$ or $-\text{CH}_2\text{-S-C}_1\text{-C}_4\text{-alkyl}$ or $-\text{CH}_2\text{-S-}$

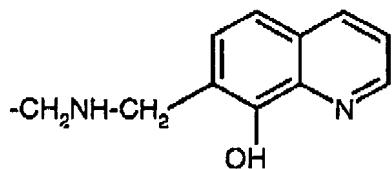
$\text{CH}_2\text{CH}(\text{NH}_2)\text{COOR}_3$ or



or its derivatives or $\text{C}=\text{S}(\text{NH}_2)$,

R_2 is a radical CH_2COOR_3 or $\text{CH}_2\text{P}(\text{O})(\text{OR}_3)_2$ or $-\text{CH}_2\text{-S-CH}_2\text{COOR}_3$ or

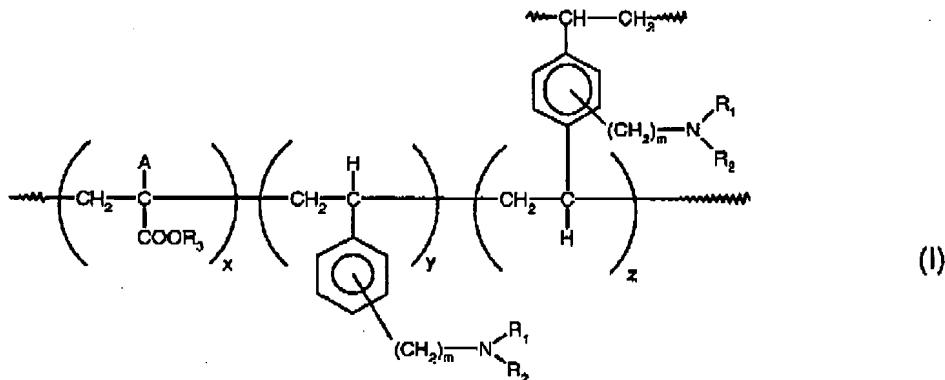
$-\text{CH}_2\text{-S-C}_1\text{C}_4\text{-alkyl}$ or $-\text{CH}_2\text{-S-CH}_2\text{CH}(\text{NH}_2)\text{COOR}_3$ or



or its derivatives or $\text{C}=\text{S}(\text{NH}_2)$ and

R_3 is H or Na or K.

3. (Currently Amended) The carboxyl-containing and also $-(\text{CH}_2)_m\text{NR}_1\text{R}_2$ group-containing ion exchanger obtainable as claimed in accordance to claim 2, characterized in that it has wherein the composition is according to the general formula (I)



where

x [=] is equal to 0.01 - 0.3,

y [=] is equal to 0.7 - 0.99,

z [=] is equal to 0.01 - 0.2,

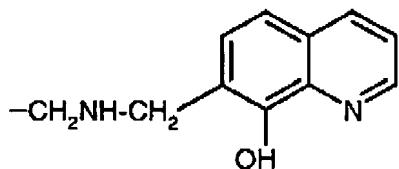
m is an integer between 1 and 4,

A is H or $\text{C}_1\text{-C}_4$ -alkyl, preferably CH_3 ,

R_3 is H or Na or K,

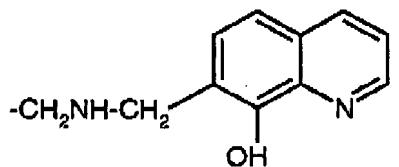
R_1 is hydrogen or a radical $\text{CH}_2\text{-COOR}_3$ or $\text{CH}_2\text{P}(\text{O})(\text{OR}_3)_2$ or $-\text{CH}_2\text{-S-CH}_2\text{COOR}_3$ or $-\text{CH}_2\text{-S-C}_1\text{-C}_4$ -alkyl or $-\text{CH}_2\text{-S-}$

$\text{CH}_2\text{CH}(\text{NH}_2)\text{COOR}_3$ or



or its derivatives or $\text{C}=\text{S}(\text{NH}_2)$ and

R_2 is a radical CH_2COOR_3 or $\text{CH}_2\text{P}(\text{O})(\text{OR}_3)_2$ or $-\text{CH}_2\text{-S-CH}_2\text{COOR}_3$ or
 $-\text{CH}_2\text{-S-C}_1\text{C}_4\text{-alkyl}$ or $-\text{CH}_2\text{-S-CH}_2\text{CH}(\text{NH}_2)\text{COOR}_3$ or



or its derivatives or $\text{C}=\text{S}(\text{NH}_2)$.

4. (Original) The use of the carboxyl -containing and $-(\text{CH}_2)_m\text{NR}_1\text{R}_2$ group-containing ion exchanger as claimed in either claim 2 or 3 for the adsorption of metals, in particular heavy metals and noble metals, and their compounds from aqueous solutions and organic liquids, for removing heavy metals or noble metals from aqueous solutions, in particular from aqueous solutions of alkaline earth metals or alkali metals, from brines of chloralkali electrolysis, from aqueous hydrochloric acids, from wastewaters or flue gas scrubbers, or else from liquid or gaseous hydrocarbons, carboxylic acids, natural gases, natural gas condensates, petroleums or halogenated hydrocarbons or for removing alkaline earth metals from brines as are customarily used in chloralkali electrolysis, and also for removing heavy metals, in particular iron, cadmium or lead from substances which are reacted during an electrolytic treatment.

5. (Original) The use as claimed in claim 4, characterized in that the heavy metals or noble metals adsorbed are mercury, iron, cobalt, nickel, copper, zinc, lead, cadmium, manganese, uranium, vanadium, elements of the platinum group, and also gold or silver.

6. (Original) The use as claimed in claim 4, characterized in that metals which can be present in the oxidation state +III are removed from sulfuric acid solutions of copper.

7. (Original) The use as claimed in claim 4, characterized in that rhodium or elements of the platinum group and also gold, silver or rhodium or noble metal-containing catalyst residues are removed from organic solutions or solvents.

8. (Currently Amended) A method for producing an iron exchanger loaded with iron oxide/iron oxyhydroxide ~~having not only comprising carboxyl groups and but also~~ $-(CH_2)_mNR_1R_2$ groups, wherein the $-(CH_2)_mNR_1R_2$ groups are defined as in claim 2, comprising characterized in that:

A') contacting a bead-type chelate-exchange resin having said carboxyl groups and $-(CH_2)_mNR_1R_2$ groups as claimed in claim 2 or 3 is brought into contact with iron(III) salts in an aqueous suspension,

B') setting the pH of the suspension obtained from stage A') ~~is set to pH~~ in the range from 3 to 10 by adding alkali metal hydroxides or alkaline earth metal hydroxides and isolating the resultant iron oxide/iron oxyhydroxide-comprising chelate-exchange resin ~~being isolated by known methods~~.

9. (Currently Amended) An iron oxide/iron oxyhydroxide-loaded ion exchanger which comprises ~~not only~~ carboxyl groups and ~~but also~~ $-(CH_2)_mNR_1R_2$ groups which is obtainable obtained by

a) reacting monomer droplets of a mixture of a monovinyl aromatic compound, a polyvinyl aromatic compound, a (meth)acrylic compound, an initiator or an initiator combination, and also if appropriate a porogen, to give a crosslinked bead polymer,

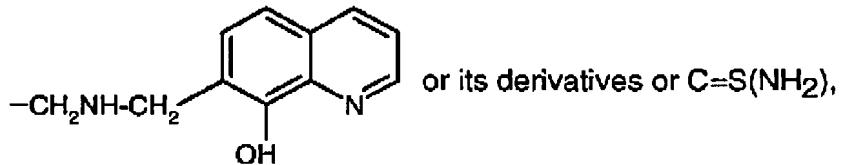
b) functionalizing the resultant bead polymer using chelating groups and, in this functionalizing step, reacting the copolymerized (meth)acrylic compounds to form (meth)acrylic acid groups,

A') contacting the bead-type ion exchanger which bears carboxyl groups and $-(CH_2)_mNR_1R_2$ groups with iron(III) salts in aqueous suspension,

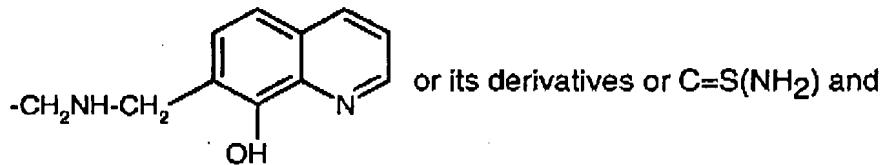
B') setting the pH of the suspension obtained from the stage A') to pHs in the range from 3 to 10 by adding alkali metal hydroxides or alkaline earth metal hydroxides and isolating the resultant iron oxide/iron oxyhydroxide-loaded chelate-exchange resin by known methods, where

m is an integer from 1 to 4,

R_1 is hydrogen or a radical CH_2-COOR_3 or $CH_2P(O)(OR_3)_2$ or
 $-CH_2-S-CH_2COOR_3$ or $-CH_2-S-C_1-C_4$ -alkyl or $-CH_2-S-$
 $CH_2CH(NH_2)COOR_3$ or



R_2 is a radical CH_2COOR_3 or $CH_2P(O)(OR_3)_2$ or $-CH_2-S-CH_2COOR_3$ or
 $-CH_2-S-C_1-C_4$ -alkyl or $-CH_2-S-CH_2CH(NH_2)COOR_3$ or



R_3 is H or Na or K.

10. (Currently Amended) A process ~~The use of the iron oxide/iron oxyhydroxide-loaded chelate-exchange resin produced as claimed in claim 9 for the adsorption of heavy metals, preferably arsenic, cobalt, nickel, lead, zinc, cadmium,~~

coppercomprising: contacting the iron oxide/iron oxyhydroxide-loaded chelate-exchange resin according to claim 9 with said heavy metal.

11. (New) The process according to claim 10, wherein the heavy metal is arsenic, cobalt, nickel, lead, zinc, cadmium, copper, or a combination thereof.

12. (New) A process for the adsorption of a heavy or noble metal and its compounds from a heavy or noble metal-containing aqueous solution or organic solution, comprising: contacting the ion exchanger according to Claim 2 with the heavy or noble metal-containing aqueous solution or organic solution.

13. (New) The process according to Claim 12, wherein the heavy or noble metal is mercury, iron, cobalt, nickel, copper, zinc, lead, cadmium, manganese, uranium, vanadium, elements of the platinum group, gold, or silver.

14. (New) The process according to Claim 12, wherein the solution is a copper sulfuric acid solution and the heavy or noble metal is present in the oxidation state +III.

15. (New) The process according to Claim 13, wherein rhodium, the elements of the platinum group, gold, or silver, or a noble metal-containing catalyst residue is removed from the organic solutions.

16. (New) A process for the adsorption of a heavy or noble metal and its compounds from a heavy or noble metal-containing aqueous solution or organic solution, comprising: contacting the ion exchanger according to Claim 3 with the heavy or noble metal-containing aqueous solution or organic solution.

17. (New) The process according to Claim 16, wherein the heavy or noble metal is mercury, iron, cobalt, nickel, copper, zinc, lead, cadmium, manganese, uranium, vanadium, elements of the platinum group, gold, or silver.

18. (New) The process according to Claim 16, wherein the solution is a copper sulfuric acid solution and the heavy or noble metal is present in the oxidation state +III.

19. (New) The process according to Claim 17, wherein rhodium, the elements of the platinum group, gold, or silver, or a noble metal-containing catalyst residue is removed from the organic solutions.

20. (New) A method for producing an iron exchanger loaded with iron oxide/iron oxyhydroxide comprising carboxyl groups and $-(CH_2)_mNR_1R_2$ groups, wherein the $-(CH_2)_mNR_1R_2$ groups are defined as in claim 3, comprising:

A') contacting a bead-type chelate-exchange resin having said carboxyl groups and $-(CH_2)_mNR_1R_2$ groups with iron(III) salts in an aqueous suspension,

B') setting the pH of the suspension obtained from stage A') in the range from 3 to 10 by adding alkali metal hydroxides or alkaline earth metal hydroxides and isolating the resultant iron oxide/iron oxyhydroxide-comprising chelate-exchange resin.